UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,040	09/12/2003	Ang Meng Liang	SAE03-001	6714

7590 10/13/2006

George O. Saile & Associates
28 Davis Avenue
Poughkeepsie, NY 12603

EXAMINER	
STAICOVICI, STEFAN	

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 10/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/661,040	LIANG ET AL.	
	Examiner	Art Unit	
	Stefan Staicovici	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 25, 2006 has been entered.

Response to Amendment

2. Applicants' amendment filed August 29, 2006 has been entered. Claims 1-19 are pending in the instant application.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 8 recite the limitation "the corners of the mold" in lines 7-8. There is insufficient antecedent basis for this limitation in the claim. Claims 2-7 and 9-19 are rejected as dependent claims.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freeman (US Patent No. 4,863,771) in view of Robin *et al.* (US Patent No. 3,892,831) and in further view of Mittelstadt *et al.* (US Patent No. 4,475,976), Azzani *et al.* (US Patent No. 5,013,514) and Nelson *et al.* (US Patent No. 6,143,236).

Freeman ('771) teaches the basic claimed process for making a tubular composite door including, providing a mold having a lower mold half (24) and an upper mold half (36), placing fiber material (38) onto said lower and upper mold halves, placing an inflatable plastic bladder (40) (plastic tube) onto said fiber material (38), closing said lower and upper mold halves, pressurizing said inflatable plastic bladder (40) (plastic tube) to force said fiber material (38) against said lower and upper mold halves, injecting resin material into said mold to impregnate said fiber material (38) and curing said resin under conditions of pressure and temperature to form said tubular composite door (see col. 2, lines 31 through col. 3, line 10). Further, Freeman ('771) teaches forming said inflatable plastic bladder (40) (plastic tube) from a plurality of bladders (plastic tubes) when making a jointed structure (10) (see Figure 1) or forming a single, complex shaped inflatable plastic bladder (see col. 3, lines 20-30).

Regarding claims 1 and 8, Freeman ('771) does not teach pre-impregnated fiber material. However, it is known that resin injection and pre-impregnation are well known equivalent

alternatives as evidenced by Robin *et al.* ('831) who teach a molding process including, providing a mold, placing fiber material around an inflatable, nylon sheath (4) to form a wrapped assembly, placing said wrapped assembly in said mold, inflating said sheath to press said fiber material against said mold and curing said resin that was either injected or pre-impregnated (see Abstract, col. 3, lines 40-55 and Figure 1-4) in said mold to form a fiber composite structure. Therefore, it would have been obvious for one of ordinary skill in the art to have used a resin pre-impregnation step as an equivalent alternative to a resin injection step as taught by Robin *et al.* ('831) in the process of Freeman ('771) because, Robin *et al.* ('831) specifically teach that resin injection and resin pre-impregnation are well known equivalent alternatives for applying a resin material to a fiber material in order to mold a fiber composite structure.

Further regarding claims 1 and 8, although Freeman ('771) teaches an inflatable plastic bladder (40), Freeman ('771) does not teach that said plastic is nylon. However, the use of nylon to make an inflatable bladder is well known as evidenced by Robin *et al.* ('831) as shown above (see Abstract, col. 3, lines 40-55 and Figure 1-4). Therefore, it would have been obvious for one of ordinary skill in the art to have provided an inflatable nylon bladder as taught by Robin *et al.* ('831) in the process of Freeman ('771) because, Robin *et al.* ('831) teach that nylon is an optimum material for such a bladder, hence teaching that it is a known material for such applications, and also because it is known that nylon is easily stretchable and has resistance to heat during the curing step, hence providing for an improved process by reducing waste. Furthermore, Freeman ('771) teaches an inflatable plastic bladder, hence suggesting the nylon material of Robin *et al.* ('831).

Further regarding claims 1 and 8, although Freeman ('771) in view of Robin *et al.* ('831) teaches applying fibrous material "manually" (see col. 2, lines 23-26), Freeman ('771) in view of Robin *et al.* ('831) do not teach compacting each composite layer by applying a vacuum. However, the use of vacuum to compact individual layers is notoriously well known as evidenced by Mittelstadt *et al.* ('976) who teach that it is conventional when building a fiber-reinforced composite to apply a plastic film and then vacuum each individual layer prior to applying an additional fiber composite layer (see col. 1, lines 23-44). Therefore, it would have been obvious for one of ordinary skill in the art to employ vacuum debulking as taught by Mittelstadt *et al.* ('976) in the process of Freeman ('771) in view of Robin *et al.* ('831) because of known advantages such as reduced porosity, hence providing for an improved product and also because Freeman ('771) in view of Robin *et al.* ('831) teach manual debulking, hence suggesting the vacuum debulking process of Mittelstadt *et al.* ('976).

Further regarding claims 1 and 8, Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976) do not each an external vacuum bag. Azzani *et al.* ('514) teach a molding process including, providing a mold (11, 12), placing fiber material around an inflatable bag to form a wrapped assembly, placing said wrapped assembly in said mold, wrapping said mold in an external vacuum bag and sealing said external bag against said inflatable bag, drawing a vacuum onto said external vacuum bag, placing said vacuum, wrapped mold in an autoclave, inflating said inflatable bag using the pressure of the autoclave to force said fiber material against said mold and curing said resin to form a fiber composite structure (see col. 4, line 47 through col. 5, line 5; col. 5, line 63 through col. 6, line 20 and Figure 16). Therefore, it would have been obvious for one of ordinary skill in the art to have used sealed an

external vacuum against an internal inflatable bladder as taught by Azzani *et al.* ('514) in the process of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976) because of known advantages that vacuum curing provides such as reduced porosity and thereby improved mechanical characteristics, hence providing for an improved product.

Further regarding claims 1 and 8, although Freeman ('771) specifically teaches the ability to remove the inflatable plastic bladder (40) (plastic tube) from the resulting molded structure (see col. 3, lines 6-10), Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976) and Azzani *et al.* ('514) do not teach pulling out the inflatable nylon bladder. However, removing an inflatable bladder by pulling is notoriously well known as evidenced by Nelson *et al.* ('236) who teach a molding process including an inflatable bladder that is removed from the molded structure by pulling (see col. 3, lines 15-23). Therefore, it would have been obvious for one of ordinary skill in the art to remove the inflatable bladder by pulling as taught by Nelson *et al.* ('236) in the process of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976) and Azzani *et al.* ('514) because of known advantages such as reduced weight and simplicity and also because, Freeman ('771) specifically teaches the ability to remove the inflatable plastic bladder, hence suggesting the process of Nelson *et al.* ('236). Further, it is noted that in order to pull the bladder of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236), it is submitted that the bladder extends out of the mold.

Further regarding claim 8, Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236) do not teach trimming the molded composite structure. However, trimming of a molded structure is well

known. It would have been obvious for one of ordinary skill in the art to have trimmed the molded composite structure obtained by the process of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236) because of known advantages such as improved aesthetics and reduced costs by reducing the complexity of mold design and allowing for some scrap to form.

Regarding claims 2 and 12, Freeman ('771) teaches a glass fiber preform and a thermosetting resin (see col. 2, line 21 and col. 3, lines 1-5). It is noted that it is well known that epoxy is a thermosetting resin used in making fiber reinforced composite structures as evidenced by Robin *et al.* ('831) who teaches an epoxy resin (see col. 3, lines 50-55). Therefore, it would have been obvious for one of ordinary skill in the art to have used an epoxy resin as taught by Robin *et al.* ('831) as the thermosetting resin in the process of Freeman ('771) in view of Mittelstadt *et al.* ('976) and in further view of Azzani *et al.* ('514) and Nelson *et al.* ('236) because of known advantages that epoxy provides such as increased chemical and mechanical characteristics, ease of processability, its well known status as a thermosetting resin used in making fiber reinforced composite structures and also because, Freeman ('771) specifically teaches a thermosetting resin, hence suggesting the epoxy resin of Robin *et al.* ('831).

In regard to claims 11 and 19, Freeman ('771) teaches pressurizing said inflatable plastic bladder (40) (plastic tube) to force said fiber material (38) against said lower and upper mold halves and maintaining pressure during the curing process (see col. 3, lines 1-10). Further, it is noted that pressure must be maintained during the curing process in order to avoid pore formation, hence in order for the invention of Freeman ('771) in view of Robin *et al.* ('831) and

in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236) to function as described.

Specifically regarding claims 3-7, 9-10 and 13-18, Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236) do not teach a specific molding temperature, molding time, vacuum pressure and curing pressure. However, it is submitted that such parameters are result-effective variables that depend on the chosen resin as taught by Freeman ('771) (see col. 3, lines 1-10). Hence, it would have been obvious for one of ordinary skill in the art to have used routine experimentation in the process of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236) to determine optimum ranges for the molding temperature, molding time, vacuum pressure and curing pressure because it is known that such parameters are result-effective variables that depend on the type of resin being used. It is noted that Azzani *et al.* ('514) teach a molding temperature of 80-200 ^{O}C, a molding pressure of 3 bars and a molding time varying from several minutes to several hours (see col. 6, lines 25-35).

Response to Arguments

7. Applicant's arguments field August 29, 2006 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (571) 272-1208. The examiner can normally be reached on Monday-Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson, can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stefan Staicovici, PhD

Stefan Staicovici 10/5/06

Primary Examiner

AU 1732

October 5, 2006